



# NOAA

Satellite and  
Information  
Service

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# Future NOAA Ground System Evolution: The NESDIS Ground Enterprise Study (NGES)

Frank W. Gallagher III and Stephen R.  
Marley

NOAA / NESDIS / OSAAP



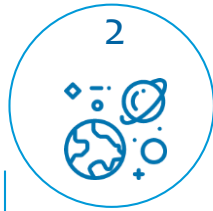
Hurricane Irma  
2017



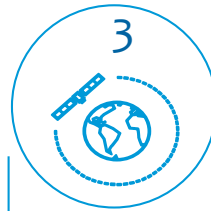
# NESDIS Strategic Objectives: An Agile and Scalable Ground Capability



**Advance terrestrial observational leadership in geostationary and extended orbits**



**Advance Space Weather observational leadership in LEO, GEO, and extended orbits.**



**Evolve LEO architecture to enterprise system of systems that exploits and deploys new observational capabilities**



**Develop agile, scalable ground capability to improve efficiency of service deliverables and ingest of data from all sources**



**Provide consistent ongoing enterprise-wide user engagement to ensure timely response to user needs**



**Deliver integrated program development to provide a suite of products and services**



# Developing the Next Generation Ground Around Three Principles

## Operational Resilience

- Secure Data Management
- Operational Flexibility
- Assured Performance

## Mission Adaptability

- Diverse Data Partners
- Agile Mission Integration
- Flexible Mission ConOps

## Long-Term Affordability

- Predictable Operations
- Efficient Mission Integration
- Service Provider Agnostic

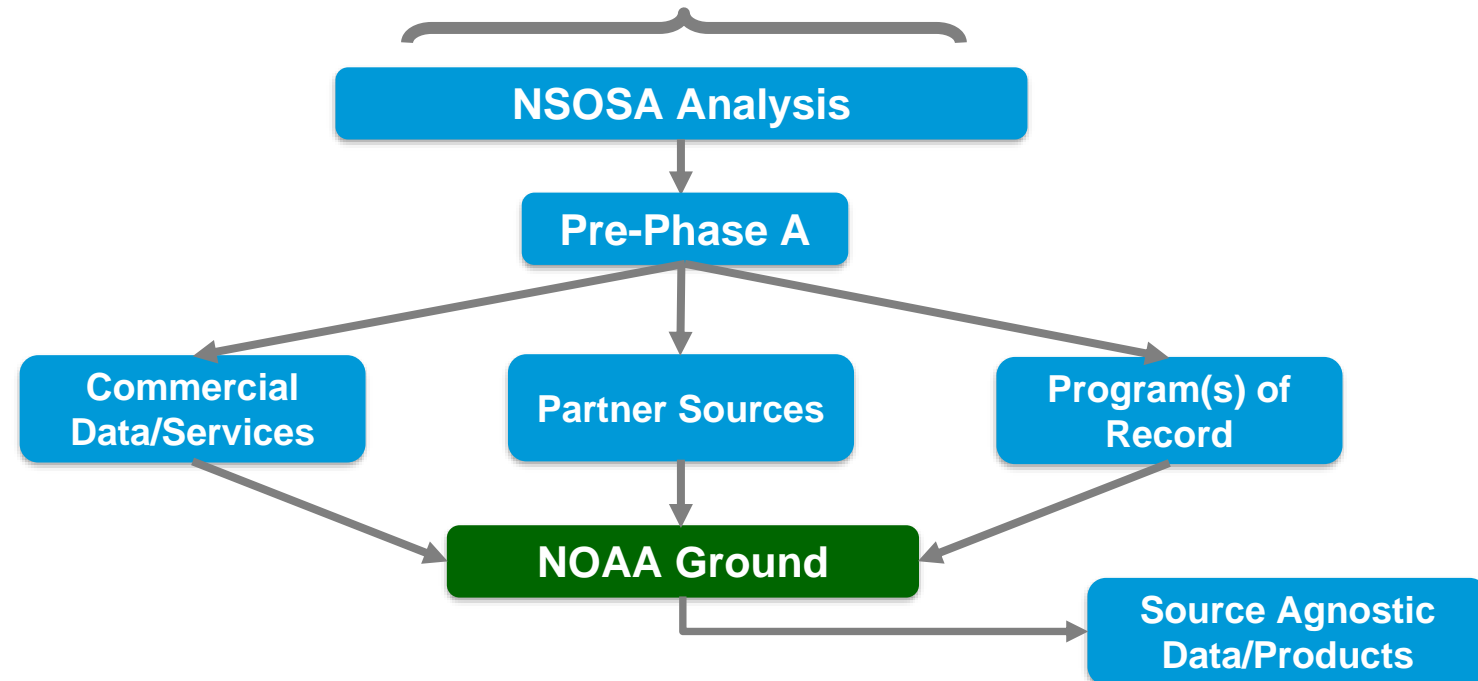


# NESDIS Ground Enterprise Study: Informing our Decisions

NESDIS finalized the NOAA Satellite Observing System Architecture (NSOSA) study in 2018

- *Cost-effective space segment architecture*
- *Programs of Record (POR's) to 2050*
- *Establishes a target reference space architecture.*

## NOAA User Prioritized Requirements

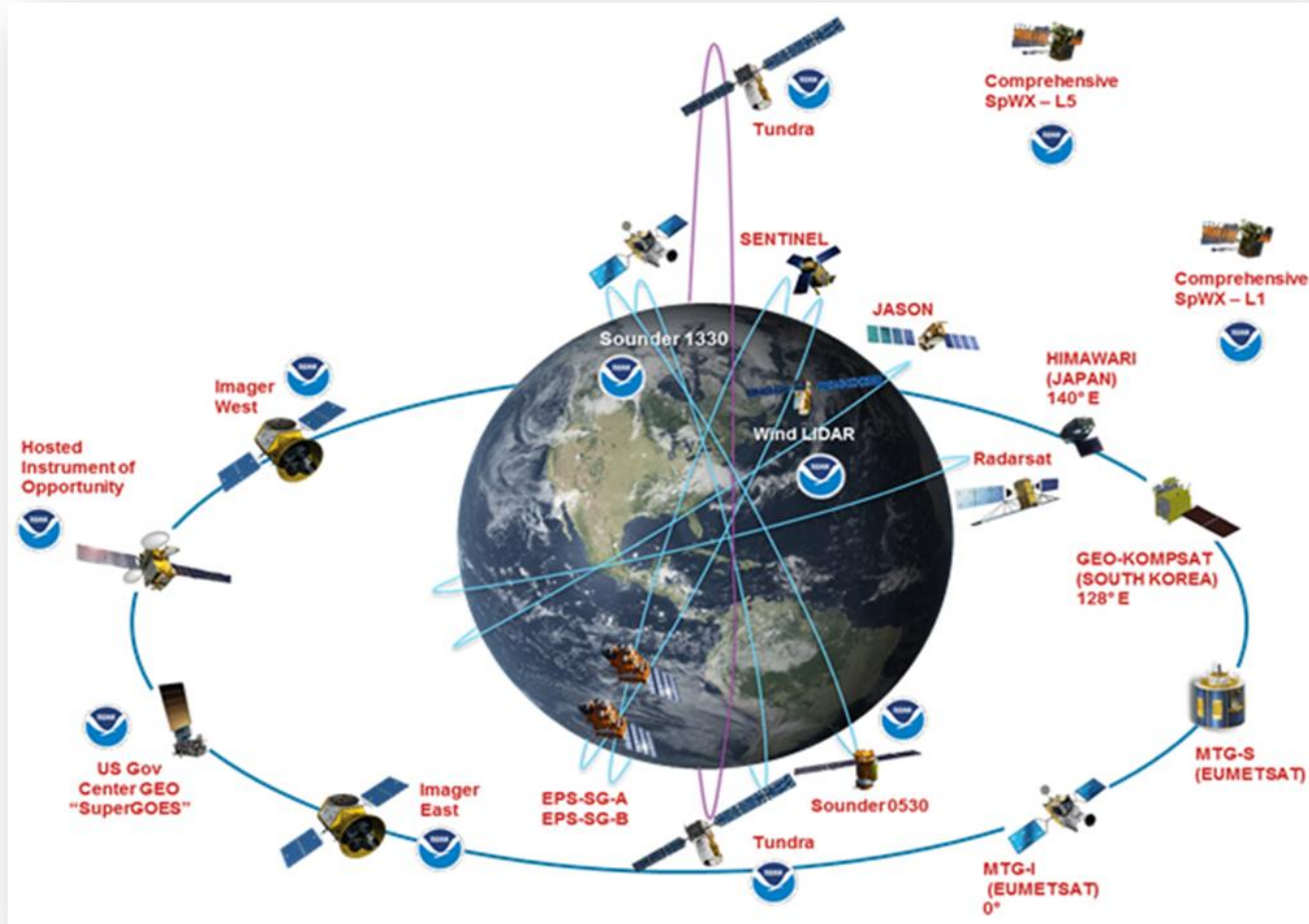




# Responding to the NSOSA Hybrid Architecture

## A Future NOAA Ground System Must:

- 1) *Securely ingest data from a wide variety of sources*
- 1) *Transform that data into advanced products*
- 1) *Exploit emerging technologies, service providers and capabilities.*



Putting that capability together is the challenge we are going to address.



# Capability Domains: Satellite, Science and Data Operations



## Satellite Operations

### Space-Ground Communications

- Ground Station Operations
- Mission Data Backhaul

### Mission Operations

- Mission Planning
- Real-time Satellite Operations
- Trending & Platform Management

## Science Operations

### Algorithm Operations

- Science R2O
- Product Cal/Val

### Environmental Information Operations

- Data Archive
- Data Stewardship
- Longitudinal Studies

## Data Operations

### Product Operations

- Data Ingest
- Product Generation

### Data Delivery

- Real Time Data Delivery
- non-Real Time Data Delivery



# Goals and Objectives of the NGES

- **Long Term Goals:**

- *Develop a disciplined, effective, and repeatable decision-making process*
- *Provide analytical tools and architectural products that support subsequent planning and implementation*

- **Objectives:**

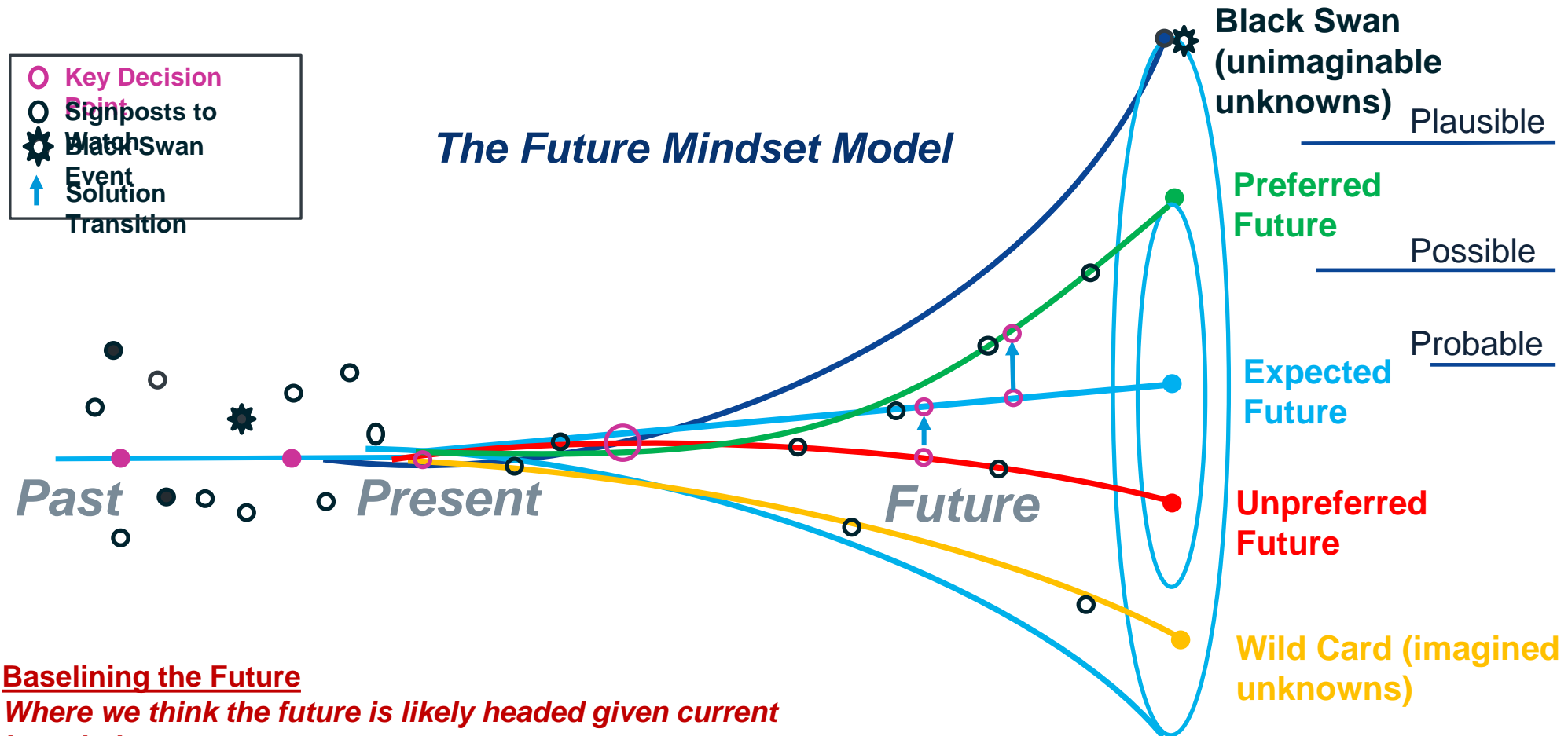
- *Establish a baseline Ground Enterprise target architecture for the 2035-2050 timeframe*
- *Build Capability Roadmaps to guide investment decisions for the coming decade*



# Strategic Foresight – An Agile Approach to the Future



## The Future Mindset Model



### Baselining the Future

Where we think the future is likely headed given current knowledge

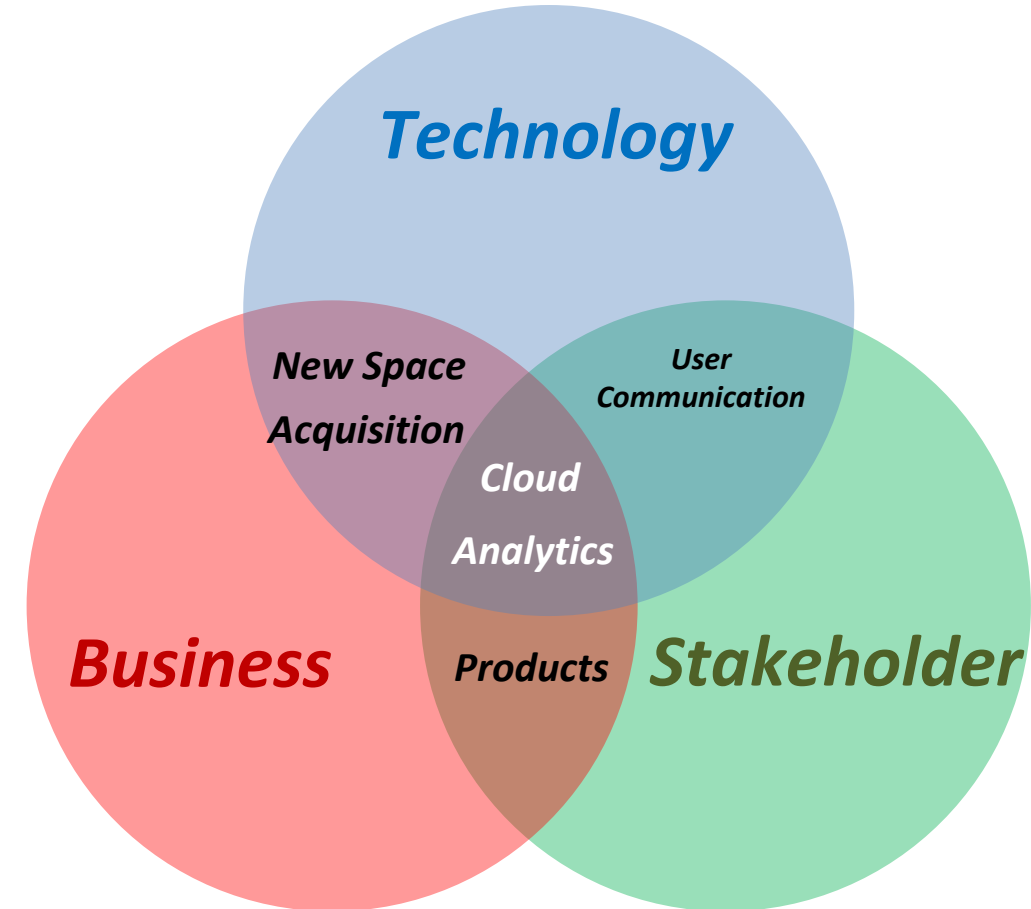
### Visioning the Future

Imagining possible preferred and un-preferred futures



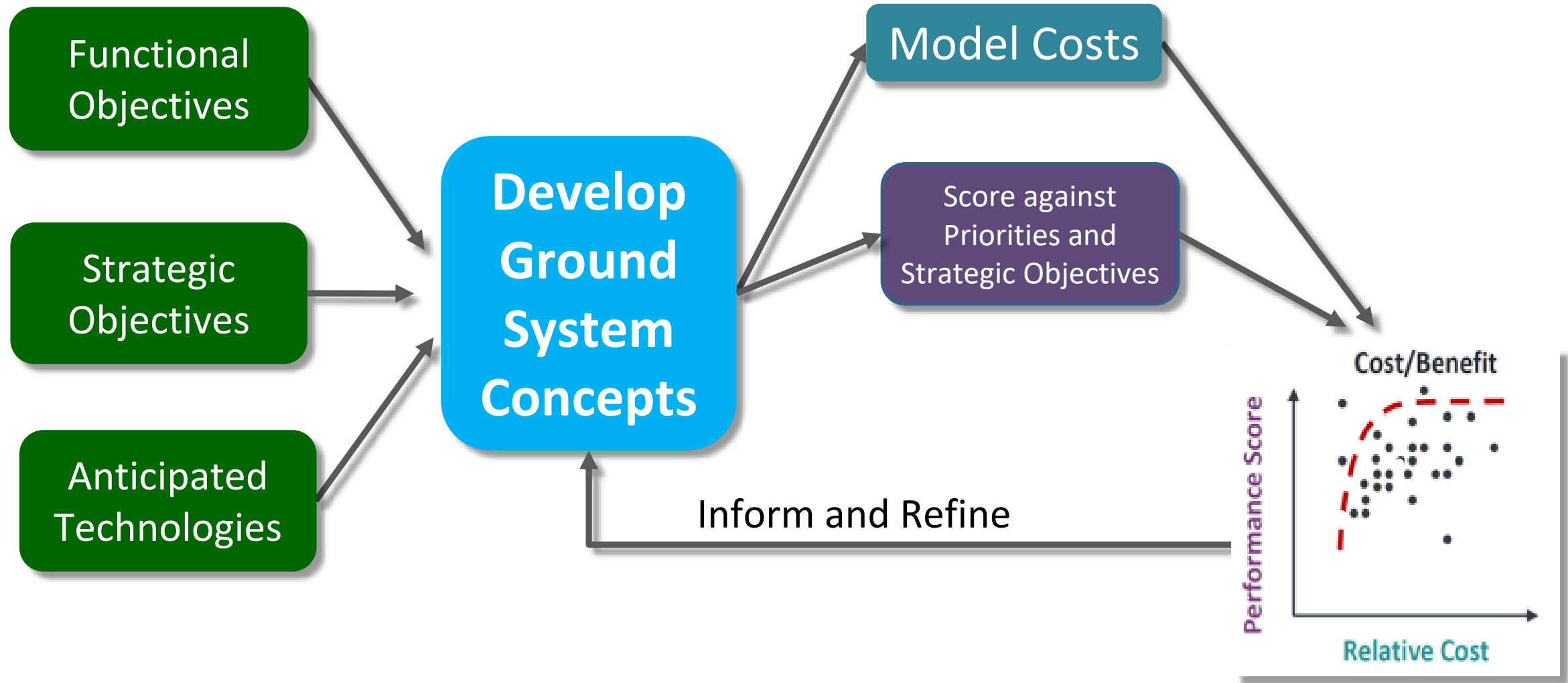
# Enterprise Ground System Trade Space

- **Cloud Deployment**
  - Commoditized ubiquitous compute platform capabilities change the way users interact with each other and how NESDIS interacts with the environmental data enterprise
- **Product Services**
  - Changing product service modalities affects how NESDIS supports Stakeholder product needs
- **Analytical Services**
  - New analytics tools/techniques change the way data is both provided by NESDIS and consumed by Stakeholders
- **User Communication Services**
  - New data delivery solutions will change the way end-users consume data
- **Enterprise Data Acquisition Services**
  - New data acquisition and command & control flexibility
- **New Space**
  - New data provider technologies will change NESDIS processes for satellite, data & science operations





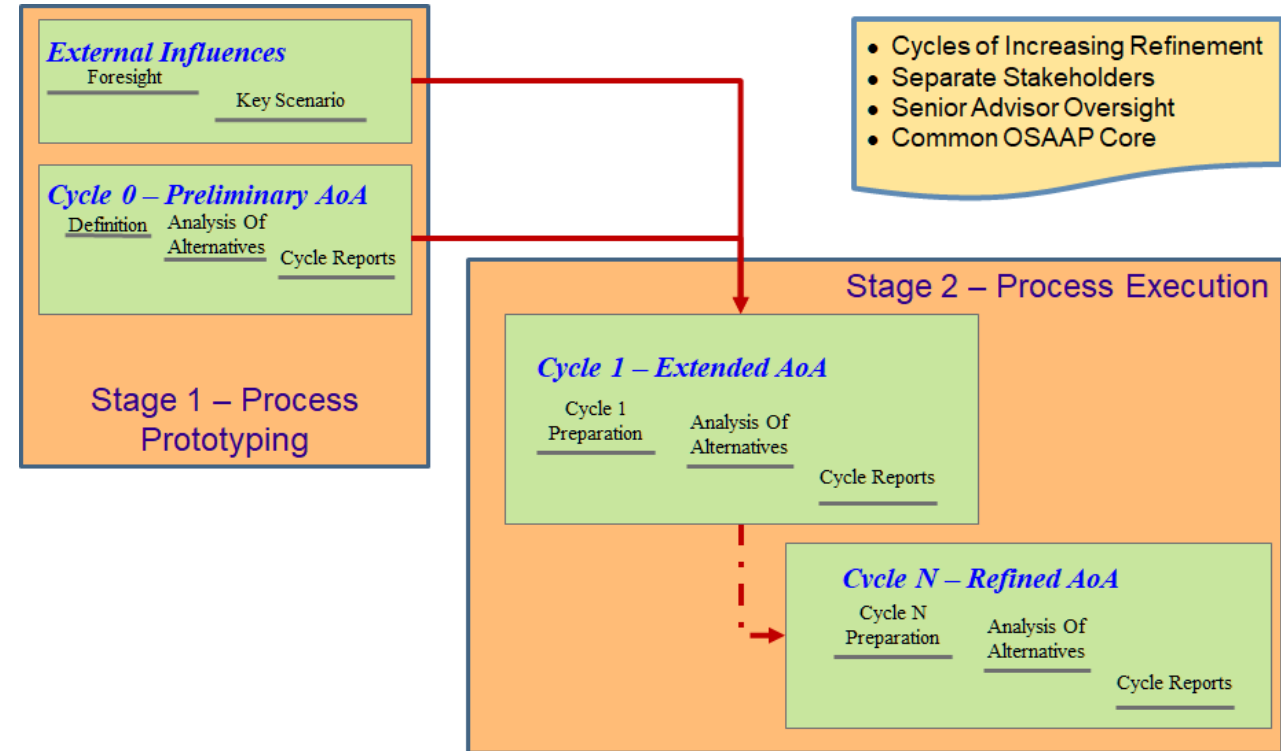
# The NGES Model





# The NGES Model

- ***Follows a model of a series of relatively short end-to-end design cycles***
  - *Agile Approach*
  - *Initial cycle is low fidelity looking for major architectural levers*
  - *Subsequent cycles are more focused on “interesting” alternatives*
  - *Subsequent cycles can incorporate unanticipated user needs, insights from the technology foresight process, additional flight architectures & ground architecture alternatives*



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# Summary

- *The NGES study is integral to the NESDIS Reimagine Strategic Objectives*
- *The NGES study completes the analysis needed for the NSOSA vision to provide an integrated, adaptable and affordable enterprise for Space & Ground operations*
- *The NGES will provide a set of Ground Enterprise Capability Portfolio management & decision support products & processes*